

## REMARKS

In accordance with the foregoing, claims 1, 8, 9 and 11-16 have been amended. Claims 1-16 are pending and under consideration.

The Examiner asserts that references AL to AQ are missing the month and year of publication. Enclosed is a substitute form PTO-1449. To the extent possible, the month and years of publication have been noted on the enclosed Form PTO-1449. However, for several of the references, the month of publication is not readily available. The Examiner is requested to note that the application claims priority to German Application No. 198 38 645.0, filed August 25, 1998. Based on this date, it appears that the month of publication is not necessary to evaluate the prior art status of reference AL, AM, AN and AP. Should questions regarding priority developed during prosecution, Applicants will provide the Examiner with all necessary information.

The Examiner also indicates that reference AL was inadequately copied. An additional copy of this reference is enclosed. Applicants are not in possession of a better copy of the reference. It is hoped that the Examiner can understand the enclosed copy.

The Examiner refers to an Information Disclosure Statement filed on June 11, 2001. However, it does not appear that an Information Disclosure Statement was filed on this date. Instead, it appears that only drawings were filed.

Applicants appreciate the Examiner's helpful review of the specification. The specification has been revised to address the items noted by the Examiner.

With regard to the drawings, revised Fig. 2 is filed herewith. This drawing address the questions noted by the Examiner.

The Examiner's suggested title has been substantially incorporated.

With regard to the claim objections, it does not appear that there is a conflict between the first discrimination value I(T) in claims 4 and 5. Claim 9 has been amended to depend on claim 8. The preamble of claim 11 has been clarified. Claim 11 is directed to a neural network: an apparatus. Claims 12 and 13 have been amended to depend from claim 11. The preamble of claim 14 has been changed from "an arrangement" to --a system--.

Claims 1, 8, 11 and 14 are rejected under 35 USC § 101 is being directed to non-statutory subject matter. The Examiner asserts that the invention is not supported by either a credible asserted utility or a well established utility. Claims 1, 8, 11 and 14 refer to a neural

network, which is tangible. One use for the neural network resides in multichannel EEG analysis, as described at page 14, lines 11-14 of the substitute specification. Specifically, the neural network can be used for tumor characterization. Page 22, lines 12-18. Further, the neural network can be used to analyze multivariate financial data to recognize trends in financial markets. See page 14, lines 16 and 17.

The claims refer to training a neural network. This is a tangible, useful and concrete result. In the paragraph bridging pages 7 and 8 of the Office Action, the Examiner indicates that a computer or computer readable medium are sufficient to comply with Section 101. The Examiner should also recognize that neural networks are sufficiently tangible. For these reasons, it is submitted that the rejection should be withdrawn.

Claims 1, 8, 11 and 14 are rejected under 35 USC § 112, first paragraph. The Examiner asserts that the claims fail to comply with the enabling requirement. In contrast to the Examiner's view, one of ordinary skill in the art can derive a complete teaching of the application from the specification. One possible object for the invention is to provide an improved ALOPEX method, and also to provide a system for training a neural network with pulsed neurons. Specifically, the method may reduce computing cost associated with training the neural network. A further object is to use the trained neural network to classify a series of input quantities. With optimized classification, the number of time values required can be minimized. Independent claim 1 is directed to training the neural network. Independent claim 14 is directed to a system for training the neural network. Independent claim 11 is directed to the neural network, as trained. Independent claim 8 is directed to a method for classification using the neural network.

According to the claims, during a first time span, a discrimination value is maximized. The discrimination value is dependent on pulses which are formed by pulsed neurons. The first time span is then shortened to a second time span. A second discrimination value is formed for the second time span. The second time span is shortened to a shortened second time span if the second discrimination value is the same as the first discrimination value. The second time span is iteratively shortened until the second discrimination value is different from (perhaps smaller than) the first discrimination value. The trained neural network is the neural network of the last iteration during which the second discrimination value was equal to the first discrimination value.

According to claim 8, the trained neural network is used to distinguish between different continuous processes (P1, P2). Based on an output signal, the process, which has an input

data set, is identified by the trained neural network.

Methods of training a neural network are known to one of ordinary skilled in the art from the technical literature referred to in the specification. Starting from the related art, the specification discloses all steps necessary to execute the method claimed, and produce the neural network and system claimed. All necessary features are disclosed.

Building on the related art information regarding training procedures and neural networks, one skilled in the art obtains a complete teaching from the specification. The claims refer to neural networks with pulsed neurons, which are also described in detail in the related art disclosed in the specification. The specification discloses that the first discrimination value is maximized by an optimization method, which does not require a gradient-based process. According to one aspect, the optimization method is based on the ALOPEX method (as disclosed at page 12, lines 12-14).

Not only claim 1, but the other independent claims and the dependent claims, are fully described so as to enable any person skilled in the art to make and use the invention. Accordingly, it is submitted that the rejection should be withdrawn.

Claims 1, 8, 11 and 14-16 are rejected under 35 USC § 103(a) as being obvious over U.S. Patent No. 5,119,816 to Gevins in view of Arroyo et al., ACM Proceedings of the 20th Annual Southeast Regional Conference (April 1982) and Peng et al., 1998 IEEE International Joint Conference on Neural Networks Proceedings (May 1998) and Deco et al., the American Physical Society Physical Review Letters (December 8, 1997).

Gevins is similar to the invention in that it relates to encephalography. However, Gevins is completely silent on the central topic of the invention, namely training of a neural network. None of the text excerpts cited by the Examiner disclose teaching or training a neural network. Neural networks are only marginally addressed; neural networks with pulsed neurons are not mentioned at all. In contrast to the Examiner's opinion, Gevins discloses no single feature of the invention since no connection exists between Gevins and the claims. The other publications also disclose no features in the invention. Accordingly, the subject matter of independent claims 1, 8, 11 and 14, and the claims dependent thereon, patentably distinguish over the references cited by the Examiner.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is

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requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: April 7 2004

By: Mark J. Henry  
Mark J. Henry  
Registration No. 36,162

1201 New York Avenue, NW, Suite 700  
Washington, D.C. 20005  
Telephone: (202) 434-1500  
Facsimile: (202) 434-1501

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on April 7, 2004  
STAAS & HALSEY  
By: Mark J. Henry  
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